

Mining of marine bioresources for the discovery of novel epoxide hydrolases

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Enantiopure epoxides are important chiral synthons in organic syntheses for producing optically active compounds. Kinetic resolution of racemic epoxides *via* enantioselective hydrolysis reaction by epoxide hydrolase (EH) is a very promising method since enantiopure epoxides with a high optical purity can be obtained from cheap and readily available racemic epoxides¹⁻³. Most of EH-catalyzed enantioselective hydrolysis of racemic epoxides have been performed using EH from soil microorganisms, plant and animal cells. In this presentation, we mined marine bioresources for the discovery of novel EHs. We accessed sequence information of putative soluble and microsomal EH from marine genomic data. Phylogenetic relationship of EH in fish and marine microorganisms with other microbial and mammalian EHs was compared to analyze the sequence-activity space. A simple and efficient spectrometric assay was developed for the measurement of an EH activity, and this assay could be applicable for the rapid and sensitive evaluation of EH activities from marine bioresources. We also screened EH activity from crude enzyme extracts containing fish's putative EH to evaluate the possibility to use marine and fish EH as biocatalysts for the enantioselective resolution of racemic epoxides.

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References

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